

## **SECTION 16122**

### **TROLLEY WIRE**

#### **PART 1 - GENERAL**

##### **1.1 DESCRIPTION OF WORK**

- A.** Work Included: This Section specifies furnishing and delivery of No. 4/0 AWG grooved bronze trolley wire for use in an overhead contact system with a nominal voltage of 600 volts dc as shown on the Contract Drawings.

##### **1.2 REFERENCES**

- A.** Conductors shall be manufactured and tested in accordance with the pertinent provisions of the applicable standards of the American Society for Testing and Materials (ASTM), Insulated Power Cable Engineers Association (IPCEA), National Electrical Manufacturers Association (NEMA), National Electric Safety Code (NESC) and National Electric Code (NEC) and other recognized standards including, but not limited to, those listed below:
1. ASTM-B9 - Specification for Bronze Trolley Wire
  2. ASTM-B105 - Hard-Drawn Copper Alloy Wires for Electrical Conductors
  3. ASTM-B193 - Resistivity of Electrical Conductor Materials, Test Method
  4. ASTM-B258 - Standard Nominal Diameters of Cross-Sectional Areas of AWG Sizes of Solid Round Wires used as Electrical Conductors

One copy of ASTM-B9 and ASTM-B105 shall be furnished to the Authority for their use and permanent record.

##### **1.3 SUBMITTALS**

- A.** The following information shall be submitted in accordance with Section 01300:
1. The Contractor shall submit shop drawings prior to trolley wire manufacture, which shall include, but not be limited to, the following:
    - a. Physical Characteristics and Parameters
    - b. Size
    - c. Type
    - d. Material
    - e. Number and diameter of individual wires
    - f. Overall diameter
    - g. Cross section area
    - h. Weight per foot
    - i. Rated breaking load

2. Electrical Characteristics

- a. Rated current carrying size (AWG/MCM)
  - b. Resistance per unit length
- B.** The Contractor shall submit certification verifying that the conductors have been designed, manufactured, inspected and tested in accordance with applicable portions of the referenced standards, these Specifications, and the Contract Drawings.
- C.** The Contractor shall submit three (3) certified copies of test reports for the specific conductors furnished, which shall include the following:
1. Initial and Final Modulus of Elasticity (E)
  2. Coefficient of Thermal Expansion (CTE)
  3. Yield stress
  4. Hardness values

**1.4 DELIVERY, STORAGE AND HANDLING**

- A.** Shipping shall take place in conformance with appropriate industry standards for packing, sealing and shipping. The Contractor shall ensure that all trolley wire furnished is suitably packaged and protected against damage during delivery and transportation. The vertical axis of the trolley wire, when installed on the reel shall be at 90°  to the axis of the reel with the small lobe on the outside. Vertical axis deviation in excess of 5° will be cause for rejection of the reel. All trolley wire shall be shipped on reels with designated lengths and shall be protected from damage. The diameter of reel shall be sufficiently large so as to minimize difficulty with waves or kinks when the trolley wire is strung.
- B.** Trolley wire reel lengths shall be determined by the Contractor so that during installation these reel lengths may be cut without waste.
- C.** The conductors shall be handled and otherwise used in accordance with the manufacturer's instructions, so as to ensure that the products are not damaged or misused prior to installation.
- D.** Any damage to the conductors in transit shall be the Contractor's responsibility, and all repairs and replacements shall be accomplished by the Contractor at no cost to the Authority.
- E.** A stripe in any contrasting color approximately one inch wide shall be painted across the outermost layer on each reel prior to shipping from manufacturing plant. Any visible conductor shift at this line, upon receipt at the job site, will be treated as indicating relative wire movement during shipment, and is cause for reel rejection.

- F.** Each reel shall have a strong, weatherproof tag or marker securely fastened to it, showing the wire number, length and type of conductor as well as the ASTM designation, name and mark of the manufacturer, total reel length and weight, manufacturer's special instructions, and contract number.

## **1.5 WARRANTY**

The Contractor shall guarantee that the wire and cable furnished under this Contract are of first-class material and workmanship throughout and agrees to replace any length of cable failing during normal and proper use, within one year of date of final inspection which shows defects of material or workmanship, provided, in each case, that immediate written notice of such failure is given to the Contractor with all reasonable opportunity to inspect such failure.

## **PART 2 - PRODUCTS**

### **2.1 TROLLEY WIRE**

- A.** The trolley wire shall be No. 4/0 AWG grooved bronze trolley wire (conductivity 80%) in accordance with MBTA Specification P-102B, except as modified herein, which is included as Appendix to this Section.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A.** Trolley wire shall be installed in accordance with Section 16123 - OVERHEAD CONTACT SYSTEM INSTALLATION.

## **PART 4 - MEASUREMENT AND PAYMENT**

### **4.1 GENERAL**

- A.** No separate measurement or payment will be made for work under this Section. All costs in connection therewith shall be considered incidental to the item of work to which it pertains.

## **END OF SECTION**